



TITLE: BIKE HANDLE <sup>SECURING</sup> ~~TIGHTENING~~ DEVICE  
~~AFTER SEPARATED FROM~~ <sup>FOR</sup> A BIKE FRAME  
~~COLLAPSIBLE~~

BACKGROUND OF THE INVENTIION

This invention relates to a ~~bike handle tightening~~  
~~for securing a bike handle to a bike frame~~  
 device after separated from a bike frame, particularly to  
<sup>the handle is</sup> ~~one~~ <sup>the</sup> ~~tightening the separated handle to the bike frame to~~  
<sup>and</sup> ~~a device which reduces~~ <sup>positioning</sup>  
~~reduce~~ <sup>a collapsible bike</sup> packaging material for storing and transporting  
 and in addition to help position a bike stably after  
 10 collapsed.

<sup>manufacturers</sup>  
 Bike ~~makers~~ generally try to reduce transporting  
~~costs by increasing~~ <sup>cost to increase</sup> the number of bikes ~~to be~~ transported in  
 a container by ~~means of~~ packaging the bike frames ~~not~~  
~~assembled with~~ <sup>disassembled from the</sup> handles <sup>the</sup> combined with <sup>the</sup> brake lines and  
 15 speed changing lines ~~so as to lessen~~ <sup>while</sup> the size of package  
 boxes. ~~Then~~ <sup>the</sup> consumers <sup>thereafter</sup> assemble the handle with the  
 brake lines and the speed changing lines with the bike  
 frame. This kind of packaging bikes is more popular for  
 collapsible bikes, which are collapsed by bending a front  
 20 frame on a rear frame or vice versa to reduce the size of  
<sup>the</sup> ~~the~~ bikes to be packaged for transporting so that <sup>manufacturers</sup> ~~makers~~ may  
<sup>reduce</sup> ~~lessen~~ the cost for package material and consumers may  
 easily carry or store <sup>their bikes</sup> ~~a bike~~. However, <sup>even after</sup> a handle is hardly  
 separated from a bike frame <sup>and later</sup> ~~once it is~~ combined with the  
<sup>for packing</sup> ~~frame~~, ~~so~~ there arises a problem that the handle with the  
 25 vertical tube of a front fork tube may <sup>still require a large</sup> ~~take not a small~~  
 space. ~~Then the~~ handle ~~is designed~~ to be bendable to  
<sup>It is known to design a</sup>

<sup>, but</sup>  
solve this problem. ~~But~~ this structure ~~has been found to~~  
<sup>has</sup>  
~~have~~ the following disadvantages

1. As for transporting, although the handle may be positioned flat on one side of the bike frame, the handle may collide with the frame <sup>and</sup> ~~to~~ result in ~~damage to the bike~~  
~~dropping of paints or disfiguring to cause a disqualified bike.~~

2. As for assembling, the frame and the handle are separated from each other, but are connected with some brake lines and speed changing lines, so consumers may forget to take out the frame together with the handle, and the handle may ~~be~~ fall down on the ground or <sup>pulled</sup> ~~pull~~ along the lines ~~to become loose or~~  
~~disfigured~~ <sup>and become damaged</sup>

3. As for collapsible bikes, the handle <sup>requires</sup> ~~needs~~ ~~to add~~ a bendable joint or a component for positioning in order to make the handle bendable <sup>and</sup> ~~to~~ reduce the package size,

4. As for the collapsed condition, there is no stabilizing means for the collapsed front frame and the collapsed rear frame in a package box, so the front frame and the rear frame may expand easily with the pivot joint as a fulcrum, especially <sup>during transport by</sup> ~~in case of~~ a user ~~carrying them to a great embarrassment to the user.~~

## 25 SUMMARY OF THE INVENTION

This invention <sup>comprises a device for securing a bike</sup> ~~is to offer a bike handle tightening~~  
<sup>handle</sup> ~~device~~ after separated from a bike frame, in order to <sup>the handle is</sup> ~~collapsible~~

<sup>packaging</sup>  
reduce its size for ~~package~~ transporting and storing and  
to help <sup>stabilize</sup> ~~the collapsed~~ <sup>stabilizing</sup> a bike ~~after collapsed~~.

The ~~feature of the invention is the~~ bike handle  
<sup>securing</sup> ~~tightening~~ device <sup>includes</sup> having a sidewise hollow fix tube, a  
<sup>hollow</sup> vertical rod of a handle ~~being hollow and~~ <sup>which is</sup> ~~sloped in~~ <sup>at</sup> its  
bottom end, a threaded rod <sup>inserted</sup> ~~inserting~~ in the vertical rod  
from its top <sup>and</sup> with its bottom <sup>end extending</sup> ~~exposing~~ out of the vertical  
rod, and a tightening member having a sloped upper  
surface to contact <sup>the</sup> ~~a~~ sloped bottom end surface of the  
vertical rod and <sup>secured together</sup> ~~screwed~~ with the threaded rod. ~~Then the~~ <sup>The</sup>  
vertical rod and the tightening member are inserted in  
the fix tube, and the threaded rod is rotated to move the  
tightening member and the vertical rod, forcing the axis  
of the tightening member and that of the vertical rod  
<sup>out of alignment</sup> ~~become not aligned~~ to <sup>permit</sup> ~~let~~ the outer surfaces of the  
tightening member and the vertical rod <sup>to</sup> ~~tightly~~ <sup>engage</sup> ~~push~~ the  
inner wall of the fix tube <sup>thereby securing</sup> ~~so as to let~~ the handle  
~~tightened~~ on the bike frame.

#### <sup>THE</sup> BRIEF DESCRIPTION OF DRAWINGS

20 This invention will be better understood by  
referring to the accompanying drawings, wherein <sup>(direct)</sup> ~~(indirect)~~

Figure 1 is an exploded perspective view of a  
handle separated from a bike frame in the present  
invention.

25 Figure 2 is a partial <sup>enlarged</sup> ~~magnified~~ view of Fig. 1.

Figure 3 is a cross-sectional view of <sup>the</sup> ~~operating~~ a  
handle <sup>securing</sup> ~~tightening~~ device in the present invention.

Figure 4 is a cross-sectional view of ~~operating a~~<sup>the</sup> handle ~~tightening~~<sup>securing</sup> device in the present invention, showing ~~a~~<sup>a</sup> different degree of tightening the handle ~~;~~<sup>;</sup>

Figure 5 is a perspective view of the handle ~~tightening~~<sup>securing</sup> device ~~tightening~~<sup>securing</sup> the handle on ~~the~~<sup>a collapsed</sup> bike frame in the present invention ~~;~~<sup>;</sup>

Figure 6 is a side view of the handle ~~tightened~~<sup>secured</sup> with the front fork of the bike frame in the present invention ~~;~~<sup>;</sup> and ~~;~~<sup>;</sup>

Figure 7 is a partial ~~magnified~~<sup>enlarged</sup> cross-sectional view of Fig. 6.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A bike handle ~~tightening~~<sup>securing</sup> device ~~after separated~~<sup>for</sup> ~~from~~<sup>from</sup> a bike frame in the present invention, as shown in Fig. 1, includes a vertical rod 41 of a handle 4 combined with a front fork tube of a front frame 1 of a bike, and a fix tube 21 fixed ~~at a proper position of~~<sup>on</sup> a rear frame 2 of ~~the~~<sup>the</sup> bike ~~as main components combined together~~<sup>;</sup>

The vertical rod 41 of the handle 4 is hollow, having a sloped bottom end surface, and a threaded rod 42 inserted ~~in~~<sup>through</sup> the vertical rod ~~from~~<sup>thru</sup> ~~its~~<sup>its</sup> top, as shown in Fig. 2. The threaded rod 42 has an upper end pivotally connected to ~~a~~<sup>an</sup> L-shaped operating rod 421, ~~and~~<sup>;</sup> a bottom end protruding out of the bottom of the vertical rod 41, and a column-shaped tightening member 43 ~~has~~<sup>having</sup> an upper sloped surface to contact the sloped bottom end surface

(direct)  
↓  
~~to unscrew~~  
~~engaged~~  
to screw

of the vertical rod 41, a center threaded hole with the threaded rod 42, and plural lengthwise straight ribs 431 formed on a longer side wall for increasing friction, as shown in Fig. 3.

5           The fix tube 21 is ~~fixed on a proper~~ <sup>secured in</sup> position ~~of a~~ <sup>the</sup> rear frame of ~~a~~ <sup>and</sup> bike, having an inner diameter ~~a bit~~ <sup>larger than the diameter of the vertical rod 41, and</sup> <sup>an optional</sup> protective cover 211 ~~inserted to close~~ <sup>for closing</sup> the outer end of the fix tube 21, as shown in Fig. 4 ~~but not absolutely~~ <sup>necessary</sup>.

10           In assembling, the bike handle ~~tightening~~ <sup>securing</sup> device may have two kinds of assembled conditions, one for collapsing and the other for riding. First, if it is assembled for collapsing, referring to Figs. 3, 4 and 5,

15   ~~Loosen~~ <sup>is loosened</sup> a collapsing joint 3 connecting the front frame 1 and the rear frame 2 to pivotally bend the front frame 1 and the rear frame 2 to each other, and then the vertical rod 41 together with the tightening member 43 is inserted in the fix tube 21 of the rear frame 2, as shown

20   in Fig. 3. ~~Then rotate the~~ <sup>The</sup> operating rod 421 <sup>is then rotated</sup> and subsequently the threaded rod 42 together, forcing the tightening member 43 <sup>to</sup> move along the threaded rod 42 ~~straightly~~ to the vertical rod 41, with the upper surface of the tightening member 43 rotating along the bottom

25   end surface of the vertical rod 41 so that the tightening member may bias out of the same axis as that of the vertical rod 41, with the lengthwise straight ribs 431 of

the tightening member 43 tightly <sup>engaging</sup> ~~pushing~~ the inner wall of the fix tube 21 while the outer wall of the vertical rod 41 contrary to the straight ribs 431 pushes against the inner wall of the fix tube 21 to <sup>secure</sup> ~~stabilize~~ the handle 4 in the fix tube 21. Then the protective cover 211 <sup>may be used to close</sup> ~~closes~~ the outer side of the fix tube 21, preventing <sup>debris</sup> ~~dirt and miscellaneous things~~ from entering the fix tube 21. Thus the handle 4 is <sup>secured together</sup> ~~tightened~~ with the collapsed bike frame as shown in Fig. 5. In addition, the upper end of the front fork tube 11 is open <sup>after</sup> ~~in case of~~ the handle 4 is <sup>secured</sup> ~~tightened~~ in the fix tube 21, so an upper cap 111 may be provided to close up the upper end of the front fork 11, as shown in Figs. 2 and 5.

As can be seen from Fig. 5, the vertical rod 41 is stabilized with the rear frame 2 <sup>when</sup> ~~in case of~~ the handle 4 <sup>is secured</sup> ~~tightened~~ in the fix tube 21, and the vertical rod 41 also pushes against the front frame 1, keeping the front frame 1 and the rear frame 2 in a stable position and preventing them from expanding, <sup>thus rendering the bike</sup> ~~making up~~ <sup>convenient to carry</sup>. ~~another kind of function for a collapsible bike.~~

Next, as shown in Figs. 6 and 7, if a user wants to ride the bike ~~collapsed~~, first separate the handle 4 from the fix tube 21, evolve the front frame 1 and the rear frame 2 with the collapsing joint 3 as a fulcrum and stabilize the joint 3, insert the vertical rod 41 of the handle 4 in the front fork tube 11, with the upper cap 111 removed. Then rotate the operating rod 421 together with

the threaded rod 42, forcing the vertical rod 41 and the  
tightening member 43 <sup>to</sup> push against the inner wall of the  
front fork tube 11 tightly, as shown in Fig. 7. Lastly the  
operating rod 421 is pressed down to contact the front  
5 fork tube 11, as shown in Fig. 6, forming the bike in a  
position to ride. <sup>to collapse</sup> ~~Provided~~ the bike ~~is wanted to be~~  
~~collapsed~~ after riding, fold the front frame 1 and the  
rear frame 2 to each other according to the process  
described above, and separate the handle 4 from the  
10 front fork tube 11 and rotate and insert the handle 4 in  
the fix tube 21 in the collapsed position shown in Figs. 4  
and 5.

The bike handle <sup>securing</sup> ~~tightening~~ device has several  
advantages ~~as understood from the aforesaid~~  
15 ~~description~~.

1. In packaging and transporting, the handle 4  
is <sup>secured</sup> ~~tightened~~ on the rear frame, not assembled with the  
front fork tube 11, <sup>thus</sup> effectively reducing the size of the  
package box, and <sup>preventing damage to</sup> ~~no possibility of the paint of~~ the  
20 bike frame ~~falling off caused by colliding with the~~  
<sup>during</sup> ~~handle in~~ transporting.

2. When a consumer buys a bike packaged and  
opens the package box to take out the bike, there is no  
<sup>danger</sup> ~~fear~~ of the handle 4 and the brake lines or the speed  
25 changing lines falling <sup>onto</sup> ~~off on~~ the ground ~~in taking out~~  
~~the bike frame~~.

3. The handle is directly taken off to reduce

~~the size of the package, <sup>thus eliminating the</sup> getting rid of a joint <sup>added</sup> for~~  
bending the handle in a conventional collapsible bike,  
~~lessening the cost for <sup>reducing</sup> packaging <sup>packaging</sup> and transporting and~~  
simplifying the whole structure.

5           4. The handle 4 also stabilizes ~~stable~~ the front  
frame 1 when the handle 4 is tightened on the rear  
frame 2, as shown in Fig. 5, so the front frame 1 and  
the rear frame 2 cannot extend with the collapsing  
joint 3 <sup>during</sup> ~~in~~ transporting or carrying,

10           5. The lengthwise straight ribs 431 on the  
outer wall of the longer side of the tightening member  
43 <sup>significantly increase</sup> ~~can largely heighten the~~ friction between the front  
fork tube 11 and the fix tube 21, <sup>thus</sup> ensuring ~~tightening~~  
<sup>that</sup> ~~function of the~~ handle 4 ~~which is then impossible to~~  
15 <sup>will not</sup> ~~fall off~~ during transporting.